

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1, 4-8, 10, 12-17 are pending in this application. Claims 2, 3, 9, and 11 are canceled without prejudice or disclaimer and Claims 1, 6, 7, 8, and 12-17 are amended. As amended Claims 1, 6, 7, 8, and 12-17 are supported by the original claims, no new matter is added.

In the outstanding Official Action, Claims 1, 2, 6-10 16 and 17 were rejected under 35 U.S.C. §103(a) as unpatentable over Shimada et al. (U.S. Patent No. 4,760,251, herein "Shimada") in view of Endou et al. (U.S. Patent No. 5,128,795, herein "Endou"); Claims 3-5, 11, 12 and 15 were rejected under 35 U.S.C. §103(a) as unpatentable over Shimada in view of Endou and further in view of Kawabata (U.S. Patent No. 5,148,304, herein "Kawabata"); Claims 13 and 14 were rejected under 35 U.S.C. §103(a) as unpatentable over Shimada in view of Endou and Kawabata and further in view of Ono (U.S. Patent No. 5,715,079).

With regard to the rejection of Claim 1 under 35 U.S.C. §103(a) as unpatentable over Shimada in view of Endou,<sup>1</sup> that rejection is respectfully traversed.

Amended Claim 1 recites an optical scanning device including an electrical correction unit configured to adjust the secondary frequency of the pixel clock at the output of the frequency dividing unit with respect to each of respective pixels included in the image signal, when the beam spot is located near the outer peripheral end of the image surface, so as to obtain uniform-velocity characteristics. Further, the scanning optical system is configured to satisfy the conditions  $0.5 \leq \text{Lin} \leq 10 \%$ , where Lin indicates the amount of the linearity, and the scanning optical system includes a scanning lens device having lens surfaces that are concentric with respect to a reflection point of a rotary deflector, where the number of

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<sup>1</sup>As Claim 1 is amended to include the subject matter of Claims 2 and 3, the Kawabata reference will also be addressed with respect to the rejection of Claim 1.

concentric lens surfaces in the scanning lens device are either equal to or larger than the number of non-concentric lens surfaces in the scanning lens device.

Thus, the scanning optical system provides an amount of linearity remaining at the outer peripheral end of the image surface. The scanning speed becomes relatively large as the beam spot approaches the outer peripheral end of the image surface. In this condition, the electrical correction unit adjusts the secondary frequency of the pixel clock at the output of the frequency dividing unit with respect to each of respective pixels included in the image signal, so as to obtain the uniform-velocity characteristics. The optical scanning apparatus of the present invention is effective in providing good performance for the optical characteristics with the use of a certain amount of linearity remaining at the outer peripheral end of the image surface in the main scanning direction.

Specifically, the use of a certain amount of linearity remaining at the outer peripheral end of the image surface enables the angle of deflection of a light beam to be reduced. While the beam spot diameter is improved by the optical design using a certain amount of linearity remaining at the outer peripheral end of the image surface, the electrical correction unit adjusts the secondary frequency of the pixel clock at the output of the frequency dividing unit with respect to each of respective pixels included in the image signal, so as to obtain the uniform-velocity characteristics.

In contrast, Shimada describes an optical scanning apparatus that not only does not include an  $f\theta$  lens, but is specifically designed to *not* include such a lens due to the expense of making such a lens.<sup>2</sup> As shown in Figure 13 of Shimada, no lens is located between photosensitive body 30 and polygonal mirror 45. Instead, Shimada describes a method of changing the frequency of the image scanning clock signal to make the scanning speed constant on the surface being scanned, which function is normally performed by an  $f\theta$  lens.

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<sup>2</sup>See Shimada, Background of the Invention

Thus, Shimada teaches away from the inclusion of a lens between the polygonal mirror and the photosensitive body, such as the “scanning lens device” recited in Claim 1. In fact, since Shimada teaches that the scanning speed is made constant on the surface being scanned by varying the image scanning clock frequency, it is respectfully submitted that the inclusion of a scanning lens device in the apparatus described by Shimada (as proposed in the outstanding Office Action<sup>3</sup>) would result in the scanning speed varying, contrary to the operating principle of Shimada and making the apparatus described by Shimada unsuitable for its intended purpose.

As Shimada teaches away from the invention recited in Claim 1, and the modification proposed by the outstanding Office Action would make the apparatus described by Shimada unsuitable for its intended purpose, it is respectfully submitted that there is no suggestion or motivation to modify the apparatus described by Shimada to include a scanning lens device. Accordingly, Claim 1 (and Claims 4 and 5 dependent therefrom) is believed to be patentable over the proposed combination of Shimada, Endou, and Kawabata.

Amended independent Claims 6, 7, 8, 16, and 17 recite similar elements to Claim 1. Accordingly, Claims 6, 7, 8, 16, and 17 (and Claims 10 and 12-15 dependent therefrom) are believed to be patentable over Shimada, Endou, and Kawabata for at least the reasons described above with respect to Claim 1.

With regard to the rejection of Claims 13 and 14 as unpatentable over Shimada, Endou, and Kawabata in view of Ono, it is noted that Claims 13 and 14 are dependent from Claim 8, and thus are believed to be patentable for at least the reasons discussed above. Further, it is respectfully submitted that Ono does not cure any of the above-noted deficiencies of the combination of Shimada, Endou, and Kawabata. Accordingly, it is

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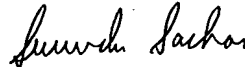
<sup>3</sup>See outstanding Office Action, page 4, lines 15-18.

respectfully submitted that Claims 13 and 14 are patentable over Shimada, Endou, and Kawabata in view of Ono.

Accordingly, in view of the present amendment, no further issues are believed to be outstanding and the present application is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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